PATENT CLAIMS

1. A fuel cell comprising
- an electrolyte (2) provided with electrodes (3) in the form of an anode and a cathode on opposite sides of the electrolyte, and
- a system of flow ducts arranged so as to bring a first flow containing a first reactant into contact with an active surface (5) on the anode (3) and to bring a second flow containing a second reactant into contact with an active surface (5) on the cathode (3), characterized in that the system of flow ducts comprises a distribution arrangement adapted to distribute a flow incoming to the active surface (5) uniformly over an inlet region (24) which extends along the active surface (5).

2. The fuel cell as claimed in claim 1, characterized in that the inlet region (24) extends along at least approximately half of, preferably essentially the whole of, the extent of the active surface (5) in the lateral direction or vertical direction.

3. The fuel cell as claimed in one of the preceding claims, characterized in that the inlet region (24) is located adjacent to one of the delimitations of the active surface (5).

4. The fuel cell as claimed in any one of the preceding claims, characterized in that the system of flow ducts comprises a collecting arrangement adapted to allow a flow outgoing from the active surface (5) to leave the active surface (5) within an outlet region (25) which extends along, preferably at least half of, preferably essentially the whole of, the active surface (5).

5. The fuel cell as claimed in claim 3 and 4, characterized in that the outlet region (25) is located

adjacent to a delimitation of the active surface (5) opposite the inlet region (24).

6. The fuel cell as claimed in claim 4 or 5, characterized in that the inlet region (24) and the outlet region (25) are essentially parallel to one another.

7. The fuel cell as claimed in any one of the preceding claims, characterized in that the distribution arrangement comprises

- a distribution chamber (32, 52) which extends in the direction along the active surface (5), and
- at least one inlet opening (22) which allows conveying-in of said flow from the distribution chamber (32, 52) to the active surface (5), said at least one inlet opening (22) defining the inlet region (24).

8. The fuel cell as claimed in claim 7, characterized in that the distribution chamber (32, 52) and the at least one inlet opening (22) are designed to provide a greater flow resistance through the at least one inlet opening (22) than through the distribution chamber (32, 52).

9. The fuel cell as claimed in one of claim 7 or 8, characterized in that the active surface (5) extends essentially in a first plane and in that the distribution chamber (32, 52) extends essentially in a second plane, which second plane is essentially parallel to the first plane and is located at a distance from the first plane, and in that the distribution chamber (32, 52) extends at least partly over a region to which, in the first plane, the active surface (5) corresponds.

10. The fuel cell as claimed in any one of claims 7 to 9, characterized in that the fuel cell is formed of a layer structure (60) comprising

- a first layer (1) in which the active surface (5) is located,
- a second layer (21) provided with said at least one inlet opening (22), and
- at least one further layer (31, 41),

where the second layer (21) is located between the first layer (1) and the at least one further layer (31, 41), the second layer (21) and the at least one further layer (31, 41) constituting limiting surfaces for the distribution chamber (32, 52).

11. The fuel cell as claimed in claim 10, characterized in that the distribution chamber (32, 52) consists at least partly of a cavity in the second layer (21).

12. The fuel cell as claimed in claim 10 or 11, characterized in that the distribution chamber (32, 52) consists at least partly of a cavity in the at least one further layer (31, 41).

13. The fuel cell as claimed in any one of claims 10 to 12, characterized in that

- the at least one further layer (31, 41) comprises a third layer (31) and a fourth layer (41),
- the distribution chamber (32, 52) consists at least partly of a through-cutout in the third layer (31),
- the second layer (21) constitutes a limiting surface for the distribution chamber (32, 52) in one direction, and
- the fourth layer (41) constitutes a limiting surface for the distribution chamber (32, 52) in the opposite direction.

14. The fuel cell as claimed in any one of claims 10 to 13, characterized in that the second layer (21) constitutes a delimiting surface in a cell space (4) at the active surface (5), and in that the second layer

(21) constitutes a delimitation between the cell space (4) and the distribution chamber (32, 52), and in that the second layer (21) is provided with at least one opening, which at least one opening allows communication between the distribution chamber (32, 52) and the cell space (4) and forms the at least one inlet opening (22).

15. The fuel cell as claimed in claim 14, characterized in that the second layer (21) is located at a distance from the active surface (5).

16. The fuel cell as claimed in claim 15, characterized in that the cell space (4) is provided with a first conducting means (71) adapted to conduct electric current between the electrode (3) and the second layer (21).

17. The fuel cell as claimed in claim 16, characterized in that the first conducting means (71) has resilient properties and/or is adapted to provide an improved flow pattern close to the active surface (5).

18. The fuel cell as claimed in claim 16 or 17, characterized in that the first conducting means (71) consists of a net structure.

19. The fuel cell as claimed in any one of claims 10 to 18, characterized in that the system of flow ducts comprises a coolant distribution system, and in that a cooling chamber (34, 34', 34'', 34''') is arranged in the at least one further layer (31, 41).

20. The fuel cell as claimed in claim 19, characterized in that the cooling chamber (34, 34', 34'', 34''') consists at least partly of a through-cutout in the at least one further layer (31, 41), and in that the second layer (21) constitutes a

limiting surface for the cooling chamber (34, 34', 34'', 34''').

21. The fuel cell as claimed in claim 19 or 20, characterized in that the cooling chamber (34, 34', 34'', 34''') is provided with a second conducting means (72) adapted to conduct electric current through the cooling chamber (34, 34', 34'', 34''').

22. The fuel cell as claimed in claim 21, characterized in that the second conducting means (72) has resilient properties and/or is adapted to provide an improved flow pattern for increased cooling effect.

23. The fuel cell as claimed in claim 21 or 22, characterized in that the second conducting means (72) consists of a net structure.

24. The fuel cell as claimed in any one of claims 4 to 6, characterized in that the collecting arrangement comprises

- a collecting chamber (33, 53) which extends in the direction along the active surface (5), and
- at least one outlet opening (23) which allows conveying-out of said flow from the active surface (5) to the collecting chamber (33, 53), said at least one outlet opening (23) defining the outlet region (25).

25. The fuel cell as claimed in claim 13, any one of claims 19 to 23, and claim 24, characterized in that the third layer (31) comprises at least one distribution chamber (32, 52), at least one collecting chamber (33, 53) and at least one cooling chamber (34, 34', 34'', 34''').

26. The fuel cell as claimed in claim 25, characterized in that the second layer (21) constitutes a delimitation for the distribution chamber (32, 52),

the collecting chamber (33, 53) and the cooling chamber (34, 34', 34'', 34''') in one direction, and in that the fourth layer (41) constitutes a delimitation for at least the distribution chamber (32, 52) and the collecting chamber (33, 53) in the other direction.

27. The fuel cell as claimed in claim 26, characterized in that the distribution chamber (32, 52) and the collecting chamber (33, 53) in the third layer (31) are intended for the first flow, and in that the fuel cell comprises a fifth layer (51) provided with a second distribution chamber (32, 52) and a second collecting chamber (33, 53), which second chambers are intended for the second flow.

28. The fuel cell as claimed in any one of the preceding claims, characterized in that the distribution arrangement is positioned on both the anode side and the cathode side of the electrolyte (2).

29. A fuel cell stack, comprising a number of fuel cells, characterized in that at least one of the fuel cells is constructed according to any one of claims 1 to 28.